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METHODOLOGICAL ISSUES

GUIDELINES ON REPORTING AND REVIEW OF GREENHOUSE GAS INVENTORIES FROM PARTIES INCLUDED IN ANNEX I TO THE CONVENTION (IMPLEMENTING DECISIONS 3/CP.5 AND 6/CP.5)

Report of an expert meeting to assess experiences in the use of the UNFCCC reporting and review guidelines

Note by the secretariat

Addendum

PROPOSAL FOR REVISION OF THE GUIDELINES FOR THE PREPARATION OF NATIONAL COMMUNICATIONS BY PARTIES INCLUDED IN ANNEX I TO THE CONVENTION, PART I: UNFCCC REPORTING GUIDELINES ON ANNUAL INVENTORIES

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I. INTRODUCTION

A. Mandate

1. By its decision 3/CP.5, the Conference of the Parties (COP) adopted guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories (hereinafter referred to as the "reporting guidelines").

2. The COP decided that revisions to these guidelines, shall be considered by the Subsidiary Body for Scientific and Technological Advice (SBSTA) at its fifteenth session with a view to submitting a decision for adoption by the COP at its seventh session.

3. The COP requested the secretariat to prepare a report on the use of these guidelines, in particular the common reporting format (CRF), taking into account, *inter alia*, the experiences of Parties in using the guidelines, and by the secretariat in processing the CRF for consideration of possible revisions of the reporting guidelines by the SBSTA at its fifteenth session. The SBSTA at its twelfth session requested the secretariat, in the report on the use of the reporting guidelines, to consider whether any modifications to the reporting guidelines are needed to reflect the good practice guidance.

4. The COP by its decision 34/CP.7 decided to defer the revision of the reporting guidelines until the sixteenth session of the SBSTA with a view to adopting a decision at its eighth session.

5. At its fifteenth session, the Subsidiary Body for Scientific and Technological Advice (SBSTA) welcomed the organization of an expert meeting by the secretariat, held from 4 to 6 December 2001 in Bonn, on methodological and operational issues relating, *inter alia*, to the use of the reporting guidelines. In addition, the SBSTA requested the secretariat to prepare a report of the expert meeting for consideration at its sixteenth session.

6. At the expert meeting, the Chairman of the SBSTA proposed that the secretariat, under his guidance, prepare draft revised reporting guidelines taking into account the experiences of Parties in using the guidelines and the secretariat in processing the common reporting format, as well as the outcome of the expert meeting (FCCC/SBSTA/2002/2) in order to facilitate consideration of the revised reporting guidelines by the Subsidiary Bodies at their sixteenth session.

B. Scope of this note

7. This note, responds to the mandate mentioned in paragraph 6 above. It contains a proposal for the revision of the reporting guidelines, which has been developed to facilitate consideration of this issue during the sixteenth session of the SBSTA. This note should be read in conjunction with the report of the expert meeting (FCCC/SBSTA/2002/2) and the proposal for revision of the CRF tables (FCCC/SBSTA/2002/2/Add.3).

8. The proposed draft revised reporting guidelines contained in the annex to this report were based largely on the reporting guidelines that were adopted by the COP at its fifth session (FCCC/CP/1999/7). The secretariat took into account the experiences of Parties in using the reporting guidelines and the secretariat in processing the CRF and coordinating the technical review process, as described in documents FCCC/SBSTA/2001/MISC.4, FCCC/SBSTA/2001/MISC.5, FCCC/SBSTA/2001/5 and Add.1, as well as the recommendations of the participants at the expert meeting (see FCCC/SBSTA/2002/2).

9. The draft revised reporting guidelines also include draft revised CRF tables that are an integral part of the reporting guidelines. For technical reasons, the CRF tables are included in an independent

document, namely FCCC/SBSTA/2002/2/Add.3. The tables contained in this addendum constitute annex II of the draft reporting guidelines.[1]

C. Possible action by the SBSTA

10. The SBSTA may wish to consider the information in this note and to endorse or modify the draft revised guidelines contained in the annex to this note. The SBSTA may also wish to forward the revised guidelines to the Subsidiary Body for Implementation (SBI) for its consideration and possible recommendation for adoption by the COP at its eighth session.

D. Approach

11. The draft revised guidelines contained in this note were prepared under the guidance of the Chairman of the SBSTA and with the assistance of the co-chairs of the expert meeting (Mr. William Kojo Agyemang-Bonsu (Ghana), Ms. Dina Kruger (United States of America), Mr. Newton Paciornik (Brazil) and Mr. Jim Penman (United Kingdom of Great Britain and Northern Ireland)). In addition, a limited number of experts with substantial inventory review experience, who acted as lead reviewers during the trial period and who participated in the meeting, also accepted the invitation of the Chairman of the SBSTA to assist him in the elaboration of the draft revised guidelines. These experts were: Mr. Ayite-Lo Ajavon (Togo), Mr. Samir Amous (Tunisia), Ms. Katarina Mareckova (Slovakia), Mr. Klaus Radunsky (Austria), Mr. Audun Rosland (Norway) and Mr. Jose Villarin (Philippines).

12. In these guidelines, as indicated in paragraph 19 and table 1, Parties should report aggregate emissions and removals of GHGs, expressed in CO_2 equivalent terms, using the global warming potential (GWP) provided by the IPCC in its "Second Assessment Report", consistent with decision 2/CP.3. The secretariat would like to draw attention to the IPCC "Third Assessment Report", which provides updated values of the GWP.

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[1] Annex I of these reporting guidelines contains the proposed structure for the national inventory report (NIR) (see page 16).

Annex

DRAFT REVISED GUIDELINES FOR THE PREPARATION OF NATIONAL COMMUNICATIONS BY PARTIES INCLUDED IN ANNEX I TO THE CONVENTION, PART I: UNFCCC REPORTING GUIDELINES ON ANNUAL INVENTORIES

A. Objectives

1. The objectives of the UNFCCC reporting guidelines on annual inventories are:

(a) To assist Annex I Parties in meeting their commitments under Articles 4 and 12 of the Convention and in preparing to meet possible future commitments under Articles 3, 5 and 7 of the Kyoto Protocol;

(b) To facilitate the process of considering annual national inventories, including the preparation of technical analysis and synthesis documentation; and

(c) To facilitate the process of verification, technical assessment and expert review of the inventory information.

B. Principles and definitions

2. National greenhouse gas inventories, referred to below only as inventories, should be transparent, consistent, comparable, complete and accurate.

3. Inventories should be prepared using comparable methodologies agreed upon by the COP, as indicated in paragraph 8 below.

4. In the context of these UNFCCC reporting guidelines on annual inventories:

Transparency means that the assumptions and methodologies used for an inventory should be clearly explained to facilitate replication and assessment of the inventory by users of the reported information. The transparency of inventories is fundamental to the success of the process for the communication and consideration of information;

Consistency means that an inventory should be internally consistent in all its elements with inventories of other years. An inventory is consistent if the same methodologies are used for the base and all subsequent years and if consistent data sets are used to estimate emissions or removals from sources or sinks. Under certain circumstances referred to in paragraphs 14 and 15, an inventory using different methodologies for different years can be considered to be consistent if it has been recalculated in a transparent manner, in accordance with the IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories;[2]

Comparability means that estimates of emissions and removals reported by Parties in inventories should be comparable among Parties. For this purpose, Parties should use the methodologies and formats agreed by the COP for estimating and reporting inventories. The allocation of different source/sink categories should follow the split of the Revised 1996 Intergovernmental Panel on Climate Change Guidelines for National Greenhouse Gas Inventories,[3] at the level of its summary and sectoral tables;

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[2] Hereinafter referred to as the "IPCC good practice guidance". The IPCC is currently developing "Good Practice Guidance for Land Use, Land-Use Change and Forestry".

[3] Hereinafter referred to as the "IPCC Guidelines".

Completeness means that an inventory covers all sources and sinks, as well as all gases, included in the IPCC Guidelines as well as other existing relevant source/sink categories which are specific to individual Parties and, therefore, may not be included in the IPCC Guidelines. Completeness also means full geographic coverage of sources and sinks of a Party;[4] and

Accuracy is a relative measure of the exactness of an emission or removal estimate. Estimates should be accurate in the sense that they are systematically neither over nor under true emissions or removals, as far as can be judged, and that uncertainties are reduced as far as practicable. Appropriate methodologies should be used, in accordance with the IPCC good practice guidance, to promote *accuracy* in inventories.

5. In the context of these guidelines, definitions of common terms used in greenhouse gas inventory preparation are those provided in the IPCC good practice guidance.

C. Scope

6. These UNFCCC reporting guidelines on annual inventories cover the estimation and reporting of greenhouse gas emissions and removals in both annual inventories and inventories included in national communications, as specified by decision 11/CP.4 and other relevant decisions of the COP.

D. Base year

7. The year 1990 should be the base year for the estimation and reporting of inventories. According to the provisions of Article 4.6 of the Convention and decisions 9/CP.2 and 11/CP.4, the following Annex I Parties that are undergoing the process of transition to a market economy are allowed to use a base year or a period of years other than 1990, as follows:

Bulgaria:	to use 1988
Hungary:	to use the average of the years 1985 to 1987
Poland:	to use 1988
Romania:	to use 1989
Slovenia:	to use 1986

E. Methods

Methodology

8. Parties shall use the IPCC Guidelines, to estimate and report on anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol. In preparing national inventories of these gases Parties should also use the IPCC good practice guidance, agreed upon by the SBSTA, in order to improve transparency, consistency, comparability, completeness and accuracy.

9. In accordance with the IPCC Guidelines, Parties may use different methods (tiers) included in those guidelines, giving priority to those methods which, according to the decision trees in the IPCC good practice guidance, produce the most accurate estimates. National methodologies used by Parties to better reflect their national circumstances should be compatible with the IPCC Guidelines and the IPCC good practice guidance and be well documented.

10. Parties may use different levels of disaggregation of source categories in accordance with their own way of preparing greenhouse gas inventories. For source categories that are key, estimated in accordance

[4] According to the instruments of ratification, acceptance, approval or accession to the Convention of a given Party.

with the provisions in paragraph 12 below, Parties should make every effort to use a recommended method, in accordance with the corresponding decision trees of the IPCC good practice guidance.

11. The IPCC Guidelines offer a default methodology which includes default emission factors and in some cases default activity data. As these default data, factors and assumptions may not always be appropriate for specific national contexts, it is preferable for Parties to use their own national emission factors and activity data, where available, provided that they are developed in a manner consistent with the IPCC good practice guidance and are considered to be more accurate, and the reporting of the emission and removal estimates and their underlying data is transparent. The revised default activity data or emission factors provided in the IPCC good practice guidance shall be used, where available, if Parties choose to use default factors or data due to lack of country-specific information.

Key source category determination

12. Parties should identify their national key source categories for the base year and the latest reported inventory year, as described in the IPCC good practice guidance, using the tier 1 or tier 2 level and trend assessment.

Uncertainties

13. Parties should quantitatively estimate the uncertainties of each IPCC source category and for the inventory totals by using at least the tier 1 method, as provided in the IPCC good practice guidance. Alternatively, Parties may also use the tier 2 method in the good practice guidance when such data are available.

Recalculations

14. The inventories of an entire time series, including the base year and all subsequent years for which inventories have been reported, should be estimated using the same methodologies, and the underlying activity data and emission factors should be obtained and used in a consistent manner. Recalculations should ensure consistency of the time series and shall be carried out only to improve accuracy and/or completeness. Where the methodology or manner in which underlying activity data and emission factors are gathered has changed, Parties should recalculate inventories for the base and subsequent years. Parties should evaluate the need for recalculations relative to the reasons provided by the IPCC good practice guidance, in particular for key sources.

15. However, in some cases activity data may be missing for some historical years, including the base year. In this case, emissions or removals for these years may need to be recalculated with alternative methodologies. In these instances, Parties should use one of the techniques provided by the IPCC good practice guidance. Parties should demonstrate that the time series is consistent.

Quality assurance/quality control (QA/QC)

16. Parties should develop an inventory QA/QC plan in accordance with the IPCC good practice guidance. Parties should implement QC procedures, including at least the tier 1 general inventory level procedures as outlined in table 8.1 of the IPCC good practice guidance. Parties are also encouraged to implement tier 2 QA/QC for key sources.

F. Reporting

1. General guidance

Estimates of emissions and removals

17. Article 12.1(a) of the Convention requires that each Party shall communicate to the COP, through the secretariat, *inter alia*, a national inventory of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol. As a minimum requirement, inventories shall contain information on the following six greenhouse gases: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), and sulphur hexafluoride (SF_6). Parties should report emissions and removals of any other greenhouse gases whose 100-year GWP values have been identified by the IPCC and adopted by the COP. Parties should also provide information on the following indirect greenhouse gases: carbon monoxide (CO), nitrogen oxides (NO_x) and non-methane volatile organic compounds (NMVOCs), as well as sulphur oxides (SO_x).

18. Greenhouse gas emissions and removals should be presented on a gas-by-gas basis in units of mass with emissions by sources listed separately from removals by sinks, except in cases where it may be technically impossible to separate information on sources and sinks in the areas of land use, land-use change and forestry. For HFCs and PFCs, emissions should be reported for each relevant chemical in the category on a disaggregated basis except in cases where paragraph 23 applies.

19. In addition, consistent with decision 2/CP.3, Parties should report aggregate emissions and removals of greenhouse gases, expressed in CO_2 equivalent terms at summary inventory level[5], using GWP values provided by the IPCC in its Second Assessment Report, referred to below as 1995 IPCC GWP values, based on the effects of greenhouse gases over a 100-year time horizon. A list of these values is given in table 1 at the end of this document. Table 1 will be amended to include any additional greenhouse gases and their 100-year GWP values or new GWP values of the gases included in table 1, once the GWP values have been adopted by the COP.

20. Consistent with decision 2/CP.3, Parties should report actual emissions of HFCs, PFCs and SF_6, where data are available, providing disaggregated data by chemical (for example, HFC-134a) and source category in units of mass and in CO_2 equivalents. Parties should make every effort to develop the necessary sources of data for reporting actual emissions. For the source categories where the concept of potential emissions applies, and Parties do not yet have the necessary data to calculate actual emissions, Parties should report disaggregated potential emissions. Parties reporting actual emissions should also report potential emissions for the sources where the concept of potential emissions applies, for reasons of transparency and comparability.

21. Parties are strongly encouraged to also report emissions and removals of greenhouse gases for which 100-year GWP values are available, but not yet adopted by the COP. These emissions and removals should be reported separately from national totals. The GWP value and reference should be indicated.

22. In accordance with the IPCC Guidelines, international aviation and marine bunker fuel emissions should not be included in national totals but should be reported separately. Parties should make every effort to both apply and report according to the IPCC good practice guidance method for separation between domestic and international emissions. Parties should also report emissions from international aviation and marine bunker fuels as two separate entries in their inventories.

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[5] CO_2 equivalent emissions should be provided at a level of category disaggregation similar to that of the summary table 7A of the IPCC Guidelines.

23. Emissions and removals should be reported on the most disaggregated level of each source/sink category, taking into account that a minimum level of aggregation may be required to protect confidential business and military information.

Completeness

24. Where methodological or data gaps in inventories exist, information on these gaps should be presented in a transparent manner. Parties should clearly indicate the sources and sinks not considered in their inventories but which are included in the IPCC Guidelines, and explain the reasons for such exclusion. In addition, Parties should use the notation keys presented below to fill in the blanks in all the tables in an inventory. This approach facilitates assessment of the completeness of an inventory. The notation keys are as follows:[6]

(a) "NO" (not occurring) for emissions by sources and removals by sinks of greenhouse gases that do not occur for a particular gas or source/sink category within a country;

(b) "NE" (not estimated) for existing emissions by sources and removals by sinks of greenhouse gases which have not been estimated. "NE" should also be used when no estimate is reported because the source is considered very small. Where "NE" is used in an inventory for emissions or removals of CO_2, N_2O, CH_4, HFCs, PFCs, or SF_6, the Party should indicate in both the NIR and the CRF completeness table why emissions could not be estimated;

(c) "NA" (not applicable) for activities in a given source/sink category that do not result in emissions or removals of a specific gas. If categories in the common reporting format for which "NA" is applicable are shaded, they do not need to be filled in;

(d) "IE" (included elsewhere) for emissions by sources and removals by sinks of greenhouse gases estimated but included elsewhere in the inventory instead of the expected source/sink category. Where "IE" is used in an inventory, the Party should indicate, using the CRF completeness table, where in the inventory the emissions or removals from the displaced source/sink category have been included and the Party should explain such a deviation from the expected category; and

(e) "C" (confidential) for emissions by sources and removals by sinks of greenhouse gases which could lead to the disclosure of confidential information, given the provisions of paragraph 23 above.

25. If Parties estimate emissions and removals from country-specific sources or sinks or of gases which are not part of the IPCC Guidelines, they should explicitly describe what source/sink categories or gases these are, as well as what methodologies, emission factors and activity data have been used for their estimation.

Key sources

26. Parties should estimate and report the percentage contribution of key source categories to their national total, to the cumulative emission level and to the emission trend. They should all be expressed in terms of CO_2 equivalent using the methods provided in the IPCC good practice guidance. This information should be included in the CRF as well as the NIR as indicated in paragraphs 38 and 46.

Verification

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[6] The notation key "0" is removed. Parties should either report the emission estimate if calculated, even though it is negligible, or use the notation key "NE". If the notation key "NE" is used Parties should provide an explanation in the completeness table on why the source category has not been estimated.

27. In accordance with the IPCC Guidelines, as well as for verification purposes, Parties should compare their national estimates of carbon dioxide emissions from fuel combustion with those estimates obtained using the IPCC Reference Approach, and report on them in annual inventories. Parties are also encouraged to report on any peer review of their inventory conducted nationally.

Uncertainties

28. Parties should report, in the NIR, uncertainties estimated as indicated in paragraph 13 above, as well as methods used and underlying assumptions with the purpose of helping prioritize efforts to improve the accuracy of national inventories in the future and guide decisions on methodological choice. If the methods used to estimate the level of uncertainty depart from the IPCC good practice guidance, these methods should be described. Quantitative information related to key sources should be reported in the CRF.

Recalculations

29. Recalculations of previously submitted estimates of emissions and removals as a result of changes in methodologies, changes in the manner in which emission factors and activity data are obtained and used or the inclusion of new sources or sinks, which have existed since the base year but were not previously reported, should be reported for the base year and all subsequent years up to the year in which the recalculations are made.

30. Recalculations should be reported in the NIR, with explanatory information, and in the relevant CRF tables. Recalculations should result in an improvement in the accuracy and completeness of the inventory and ensure the consistency of the time series. In this regard, Parties should report justifications for the recalculations. Parties should also provide explanations for those cases in which they have not recalculated an estimate when such a recalculation is called for in IPCC good practice guidance. Information on the procedures used for performing the recalculations, changes in the calculation methods, emission factors and activity data used and the inclusion of sources or sinks, should be reported with an indication of the relevant changes in each source or sink category where these changes have taken place. For key sources, Parties should include this information in the NIR, as indicated in paragraph 38 below.

31. Parties should report any other changes in estimates of emissions and removals, regardless of magnitude, and clearly indicate the reason for the changes compared with previously submitted inventories, e.g., error correction, statistical or editorial changes or reallocation of sources, using the corresponding CRF table, as indicated in paragraph 46 and outlined in annex II of these guidelines.

QA/QC

32. Parties should report on their QA/QC plan and give information on QA/QC procedures already implemented or to be implemented in the future in the NIR.

Adjustments[7]

33. Inventories are to be reported without adjustments related, for example, to climate variations or trade patterns of electricity. If Parties, in addition, carry out such adjustments to inventory data, they should be reported separately and in a transparent manner, with clear indications of the method followed.

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[7] The adjustments referred to here are related to e.g., climate variations or trade patterns of electricity. They do not refer to adjustments under Article 5.2 of the Kyoto Protocol.

34. Adjustments are regarded as important information for monitoring emission and removal trends and the performance of national policies and measures. Individual Parties may choose whether to make adjustments in addition to reporting unadjusted inventory data, and if so, they should indicate which methods have been chosen. Parties are further encouraged to share with others their experiences in making adjustments.

2. National inventory report

35. Parties shall submit to the Conference of the Parties, through the secretariat, an NIR containing detailed and complete information on their inventories. The NIR should ensure transparency and contain sufficiently detailed information to enable the inventory to be reviewed. This information should cover the base year[8] and the latest inventory year and any changes to previously submitted inventories. If previously submitted inventories remain unchanged, the NIR should reference the inventory submission in which the unchanged data was reported originally.

36. The NIR shall be submitted annually in its entirety to the COP, through the secretariat, in accordance with the relevant decisions of the COP, either as a printed document or electronically, and it should be updated annually to reflect changes.

37. Parties shall publish their NIRs and may fulfil that obligation by keeping the NIR in its entirety on their national web sites. If the NIR is posted on a national web site, the address of the exact location should be indicated in the CRF and in the NIR.

38. The NIR should include:

(a) Annual inventory information, submitted in accordance with paragraphs 35 above and 42 below;

(b) A description of the specific methodologies and assumptions used in each sector, including an indication of the level of complexity (IPCC tiers) applied and a description of any national methodology used by the Party, as well as information on anticipated future improvements in methodologies;

(c) References or sources of information related to methodologies, emission factors and activity data, as well as the rationale for their selection. For key sources, an explanation should be provided if the recommended methods from the appropriate decision tree in the IPCC good practice guidance are not used. In addition, any use of emission factors or activity data for key sources that depart from the IPCC good practice guidance should be justified;

(d) Information on assumptions and conventions underlying the emission and removal estimates, as well as the rationale for their selection;

(e) A description of the national key sources as indicated in paragraph 26,[9] including:

(i) Reference to the key source tables in the CRF;

(ii) Information on the level of source category disaggregation used and its rationale;

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[8] According to the provisions of Article 4.6 of the Convention and decisions 9/CP.2 and 11/CP.4, some Parties with economies in transition are allowed to use base years other than 1990, as mentioned in paragraph 7 above.

[9] The secretariat will also perform a standardized key source determination for all Parties, based on Table 7.1 of the IPCC good practice guidance. Parties may also use this approach if it is consistent with the way they prepare their inventories.

(iii) Additional information related to the methodology used for identifying key sources;

(f) With regard to possible double counting or non-counting of emissions, Parties should indicate in the corresponding sectoral part of the NIR:

(i) Whether feedstocks have been accounted for in the inventory, and if so, where they have been accounted for in the energy or industrial processes sector;

(ii) Whether CO_2 from agricultural soils has been estimated and if so, where it has been accounted for in the agriculture sector (under category 4.D – Agricultural soils) or in the LUCF sector (category 5.D – CO_2 Emissions and removals from soil);

(g) Parties are encouraged to provide background data and descriptions of methodologies used to estimate emissions/sinks from the LUCF sector to enhance transparency;[10]

(h) Information on uncertainties, as requested in paragraph 28 above;

(i) Information on any recalculations related to previously submitted inventory data, as requested in paragraphs 29 to 31 above;

(j) The NIR should include information on QA/QC as requested in paragraph 32 above, describing the QA/QC activities for individual source categories, in particular key sources, and the entire inventory performed internally, as well as on the external reviews conducted, if any. Key findings on the quality of the input data, methods, processing and archiving and how they have been addressed, should be described;

(k) A separate section clearly identifying changes from previous years, including the changes in methodologies, sources of information and assumptions, as well as changes in response to the review process; and

(l) A description of the institutional arrangements for inventory preparation.

39. If any of the information required under subparagraphs (a) to (k) above is provided in detail in the CRF, Parties should indicate in the NIR where in the CRF this information is provided.

40. The NIR should be reported in accordance with the outline included in annex I of these guidelines, ensuring that all requested information in paragraph 38 above is included.

3. Common reporting format

41. The common reporting format is designed to ensure that Parties report quantitative data in a standardized format and to facilitate comparison of inventory data and trends among Parties. Explanation of information of a non-quantitative character should mainly be provided in the NIR rather than in the CRF tables. The CRF should include a specific cross-reference to the corresponding section of the NIR.

42. Parties shall submit annually to the COP, through the secretariat, the information required in the CRF as contained in the annex II to these guidelines.[11] This information shall be submitted on an annual

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[10] The SBSTA may wish to consider this issue when the development of guidance on good practices for the LUCF sector by the IPCC is completed and, as appropriate, expand this sub-paragraph in any subsequent revisions of these guidelines.

basis for the last but one year prior to the year of submission, in accordance with paragraph 6. It should be formally submitted in both electronic form and hard copy. The CRF is an integral part of the NIR referred to in section 2 above.

43. The information provided by the CRF is aimed at enhancing the comparability and transparency of inventories by facilitating, *inter alia*, activity data and aggregate emission factor cross-comparisons among Parties, and easy identification of possible mistakes, misunderstandings and omissions in the inventories.

44. The CRF is a standardized format for reporting estimates of greenhouse gas emissions and removals and other relevant information. An electronic version will be supplied to Parties by the secretariat and will also be available on the UNFCCC web site (see FCCC/SBSTA/2002/2/Add.3). The CRF allows for the improved handling of electronic submissions and facilitates the processing of inventory information and the preparation of useful technical analysis and synthesis documentation.

45. The CRF follows the source/sink category split of the IPCC sectoral tables. It provides minimum information on methods, aggregate emission factors and activity data, as well as relevant assumptions that underlie the estimates given in the sectoral tables.

46. The CRF consists of:

(a) Summary, sectoral and trend tables;

(b) Sectoral background data tables for reporting aggregate emission factors[12] and activity data, including:

(i) The IPCC worksheet 1-1 containing estimates of CO_2 emissions from fuel combustion using the IPCC Reference Approach and a table for comparing estimates under this Reference Approach with national estimates, as well as providing explanations of any significant differences;[13] and

(ii) Tables for reporting feedstocks, international bunkers and multilateral operations; and

(c) Tables for reporting, *inter alia*, key sources, uncertainty, recalculations and completeness of the inventory.

47. The CRF should be reported in accordance with the tables included in annex II to these guidelines, ensuring that all requested information in paragraph 46 above is included.[14] In completing these tables Parties should:

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[11] Annex II of the reporting guidelines is not included in this note on a draft revision of the guidelines. The CRF tables are contained in FCCC/SBSTA/2002/2/Add.3. When the COP adopts these guidelines, both the guidelines and the CRF tables will be included in the same document.

[12] The sectoral background tables were designed to allow calculation of aggregate (implied) emission factors. These are top-down ratios between a Party's emissions estimate and aggregate activity data. The implied emission factors are intended solely for purposes of data comparison. They will not necessarily be the emission factors actually used in the original emissions estimate, unless this was a simple multiplication based on the same aggregate activity data used to calculate the implied emission factor.

[13] Detailed explanations should be included in the NIR.

[14] Annex II of the reporting guidelines is not included in this note on draft revision of the guidelines. The CRF tables are contained in FCCC/SBSTA/2002/2/Add.3. When the COP adopts these guidelines both the guidelines, and the CRF tables will be included in the same document.

(a) Provide the full CRF for the latest inventory year and for those years for which any change in any sector has been made. For years where no changes are made, re-submission of full CRF tables is not necessary, but a reference should be made to the inventory submission in which the unchanged data were reported originally;

(b) Provide the CRF trend tables covering inventory years for the entire time series in one submission only, that is, in the CRF for the last inventory year;

(c) Provide completeness and/or uncertainty tables in one submission only if the information applies to all years. If the information in these tables differs for each reported year, then either the tables or information on the specific changes must be provided for each year in the CRF; and

(d) Use the documentation boxes provided at the foot of the sectoral background data tables to provide references to detailed explanations in the NIR, or any other information, as specified in those boxes.

48. Parties should provide the information requested in the additional information boxes. Where the information called for is inappropriate because of the methodological tier used by the Party, the corresponding cells should be completed using the notation key "NA". In such cases, the Parties should reference in the documentation box the relevant section in the NIR where equivalent information can be found.

49. Parties should use the notation keys, as specified in paragraph 24 above, in all tables of an inventory, to fill in the cells where there is no estimate of emissions. The notation keys should be limited to those cells where data is otherwise entered. Using the notation keys in this way facilitates the assessment of the completeness of an inventory. For the use of notation keys in CRF tables where non-quantitative information is required, specific guidance on how they should be used in each table is provided.

50. Neither the order nor the notations of the columns, rows or cells should be changed in the tables because this will complicate data compilation. Any additions to the existing disaggregation of source and sink categories should be provided under "Other", if appropriate.

G. Record keeping

51. Parties should gather and archive all relevant inventory information for each year, including all disaggregated emission factors, activity data and documentation on how these factors and data have been generated, including expert judgement where appropriate, and how they have been aggregated for reporting in the inventory. This information should allow reconstruction of the inventory by the expert review teams, *inter alia*. Inventory information should be archived from the base year and should include corresponding data on the recalculations applied. The "paper trail" should enable estimates of emissions and removals to be traced back to the original disaggregated emission factors and activity data. This information should also facilitate the process of clarifying inventory data in a timely manner when the secretariat prepares annual compilations of inventories or assesses methodological issues. Parties are encouraged to collect and gather the information in a single national inventory facility or, at least, to keep the number of facilities to a minimum.

H. Systematic updating of the guidelines

52. Relevant future decisions, once taken by the COP, regarding the reporting of inventories under the Convention should be applied *mutatis mutandis* to these UNFCCC reporting guidelines on inventories, which will be updated accordingly.

I. Language

53. The national inventory report shall be submitted in one of the official languages of the United Nations. Annex I Parties are also encouraged to submit, where relevant, a translation of the national inventory report into English.

Table 1: 1995 IPCC global warming potential (GWP) values[15] based on the effects of greenhouse gases over a 100-year time horizon.

Greenhouse gas	Chemical formula	1995 IPCC GWP
Carbon dioxide	CO_2	1
Methane	CH_4	21
Nitrous oxide	N_2O	310
Hydrofluorocarbons (HFCs)		
HFC-23	CHF_3	11 700
HFC-32	CH_2F_2	650
HFC-41	CH_3F	150
HFC-43-10mee	$C_5H_2F_{10}$	1 300
HFC-125	C_2HF_5	2 800
HFC-134	$C_2H_2F_4$ (CHF_2CHF_2)	1 000
HFC-134a	$C_2H_2F_2$ (CH_2FCF_3)	1 300
HFC-152a	$C_2H_4F_2$ (CH_3CHF_2)	140
HFC-143	$C_2H_3F_3$ (CHF_2CH_2F)	300
HFC-143a	$C_2H_3F_3$ (CF_3CH_3)	3 800
HFC-227ea	C_3HF_7	2 900
HFC236fa	$C_3H_2F_6$	6 300
HFC-254ca	$C_3H_3F_5$	560
Perfluorocarbons		
Perfluoromethane	CF_4	6 500
Perfluoroethane	C_2F_6	9 200
Perfluoropropane	C_3F_8	7 000
Perfluorobutane	C_4F_{10}	7 000
Perfluorocyclobutane	c-C_4F_8	8 700
Perfluourpentane	C_5F_{12}	7 500
Perfluorohexane	C_6F_{14}	7 400
Sulphur hexafluoride	SF_6	23 900

[15] As provided by the IPCC in its Second Assessment Report.

Annex I

NATIONAL INVENTORY REPORT (NIR)
PROPOSED STRUCTURE

EXECUTIVE SUMMARY

General overview, including summary information on emission trends

Chapter 1: INTRODUCTION

- A description of the institutional arrangement for inventory preparation
- Brief description of the process of inventory preparation (data collection, data processing, data storage)
- Brief general description of methodologies used (including information on activity data and emission factors)
- Information on the QA/QC plan including verification and treatment of confidentiality issues where relevant
- General uncertainty assessment, including data on the overall uncertainty for the inventory totals
- General assessment of the completeness

Chapter 2: TRENDS IN GREENHOUSE GAS EMISSIONS

- Emission trends by sources and synthesis analysis
- Emission trends by gas and synthesis analysis
- Emission trends for aggregated GHG emissions, expressed in CO_2 equivalent, and synthesis analysis
- Emission trends for indirect greenhouse gases and SO_2

Chapter 3: KEY SOURCES

- Description of methodology used for identifying key sources
- Reference to the key source tables in the CRF
- Information on the level of disaggregation

Chapter 4: RECALCULATIONS

- Implication for emission levels
- Implications for emission trends
- Justifications for recalculations

Chapter 5: SECTOR ANALYSIS

For each IPCC source category (i.e., at the level of the table Summary 1.A of the CRF, or the level at which IPCC methods are described, or at the level that the Party estimates its greenhouse gas emissions) the following information should be provided:

- Methodological issues (choice of methods/activity data/emission factors, assumptions, parameters and conventions underlying the emission and removal estimates – the rationale for

their selection, any specific methodological issues – refer to appropriate documents and references)
- Uncertainties
- Source-specific verification, if applicable
- Source-specific QA/QC, if applicable
- Source-specific recalculations (including time-series consistency), if applicable

Parties may report some of the information requested above in an aggregate form for some/several source categories if the same methodology, activity data and/or emission factors are used, or in order to avoid repetition of information.

For key source categories, the information should be detailed in order to enable a thorough review of the inventory.

The information should be reported following the IPCC sectors:

5.1 Energy

5.1.1 Fuel combustion, including detailed information on:
- The comparison with the CO_2 reference approach
- Bunker fuels
- Feedstocks
- Military or any other country-specific issue

5.1.2 Fugitive emissions

5.2 Industrial processes

5.3 Solvent and other product use

5.4 Agriculture

5.5 LUCF

5.6 Waste

5.7 Other (if applicable)

In addition, information previously included in the additional information and the documentation boxes of the CRF version for the trial period, should be included and expanded in the NIR, as specified in the appendix to this proposed structure.

Chapter 6: IMPROVEMENTS

- Actions undertaken in response to issues raised in previous reviews
- Future improvement of the inventory (e.g., methodologies, activity data, emission factors, etc.)

REFERENCES

ANNEXES

Annex 1
National energy balance

Annex 2
Additional information to be considered as part of the NIR submission (where relevant)

Annex 3
Detailed methodological description (where relevant)

Annex :
(Any other relevant information – optional)

Appendix

ADDITIONAL SECTORAL REPORTING REQUIREMENTS TO BE INCLUDED IN THE CORRESPONDING SECTION OF THE NIR[1]

Energy

Fugitive fuel emissions:

Coal mining:
- number of active underground mines
- number of mines with drainage (recovery) systems

Oil and natural gas:
- pipelines length
- number of oil wells
- number of gas wells
- gas throughput[(a)]
- oil throughput[(a)]
- any other relevant information

[(a)] In the context of oil and gas production, throughput is a measure of the total production, such as barrels per day of oil, or cubic meters of gas per year. Specify the units of the reported values. Take into account that these values should be consistent with the activity data reported under production in table 1.B.2 of the CRF.

Industrial processes

Metal production:
- More specific information than is required in CRF tables 2(I).A-G could be provided, e.g., data on virgin and recycled steel production.

Potential emissions of halocarbons and SF_6:

- In CRF table 2(II)s2, reporting of "production" refers to production of new chemicals. Recycled substances could be included in that table, but it should be ensured that double counting of emissions is avoided. Relevant explanations should be provided in the NIR.

PFCs and SF_6 from Metal production / Production of halocarbons and SF_6:

- The type of activity data used is to be specified in CRF tables 2(II).C-E (under column "description"). Where applying tier 1b (for 2.C Metal production), tier 2 (for 2.E Production of halocarbons and SF_6) and country-specific methods, any other relevant activity data used should be specified.

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[1] Most of the requirements included in this list were previously reported in the additional information boxes of the CRF tables. As the information is not used directly for the estimation of emissions, participants at the expert meeting recommended that they should be reported in the NIR instead. Some requirements included in this list were not previously covered in the CRF; they emerged as a result of the expert meeting and comments provided by Parties.

Consumption of halocarbons and SF_6:

- With regard to activity data reported in CRF table 2(II).F ("Amount of fluid remained in products at decommissioning"), Parties should provide information on the amount of the chemical recovered (recovery efficiency) and other relevant information used in the emission estimation;
- CRF table 2.(II).F provides for reporting of the activity data and emission factors used to calculate actual emissions from consumption of halocarbons and SF_6 using the "bottom-up approach" (based on the total stock of equipment and estimated emission rates from this equipment). Some Parties may prefer to estimate their actual emissions following the alternative "top-down approach" (based on annual sales of equipment and/or gas). Those Parties should provide the activity data used in that CRF table and provide any other relevant information in the NIR. Data these Parties should provide includes (1) the amount of fluid used to fill new products, (2) the amount of fluid used to service existing products, (3) the amount of fluid originally used to fill retiring products (the total nameplate capacity of retiring products), (4) the product lifetime, and (5) the growth rate of product sales, if this has been used to calculate the amount of fluid originally used to fill retiring products. Alternatively, Parties may provide alternative formats with equivalent information.

Solvents and other product use

- The IPCC Guidelines do not provide methodologies for the calculation of emissions of N_2O from Solvent and other product use. If reporting such data in the CRF, Parties should provide additional information (activity data and emission factors) used to make these estimates in the NIR.

Agriculture

Cross-cutting:

- Parties are encouraged to provide detailed livestock population data by animal type and region in the NIR. This consistent set of animal population statistics should be used to estimate CH_4 emissions from enteric fermentation, CH_4 and N_2O from manure management, N_2O direct emissions from soil and N_2O emissions associated with manure production, as well as emissions from the use of manure as fuel and sewage-related emissions reported in the waste sector.

Enteric fermentation:

- Disaggregated livestock population data (e.g., according to the classification recommended in the good practice guidance);
- Parameters relevant to the application of good practice guidance.

Manure management:

- Information required in the additional information table may not be directly applicable to country-specific methods developed for methane correction factor (MCF) calculations. If relevant data can not be provided in the additional information box, information on how the MCF are derived should be described in the NIR;
- Disaggregation of livestock population (e.g., according to the classification recommended in the good practice guidance).
- Parameters relevant to the application of good practice guidance.

Rice cultivation:

- When disaggregating by more than one region within a country and/or by growing season, provide additional information on disaggregation and related data in the NIR. Where available, provide activity data and scaling factors by soil type and rice cultivar in the NIR.

Agricultural soils:

- The IPCC Guidelines do not provide methodologies for the calculation of CH_4 emissions or CH_4 and N_2O removals from agricultural soils. If reporting such data, Parties should provide in the NIR additional information (activity data and emission factors) used to make these estimates;
- Parties which choose to account for CO_2 emissions and removals from agricultural soils under category 4.D. Agricultural soils of the agriculture sector should report background information on CO_2 emissions and removals estimates from agricultural soils (activity data, emissions factors) in the NIR;
- In addition to the data required in the additional information box of table 4.D, disaggregated values for FracGRAZ according to animal type, and for FracBURN according to crop types, should be provided in the NIR.

Prescribed burning of savannas and field burning of agricultural residues:

- The IPCC Guidelines do not provide methodologies for the calculation of CO_2 emissions from savanna burning or agricultural residues burning. If reporting such data, Parties should provide in the NIR additional information (activity data and emission factors) used to make these estimates.

Waste

Solid waste disposal and waste incineration:

- All relevant information used in the calculation should be provided in the NIR, if it not already included in the additional information box of the CRF.
- Composition of landfilled waste (%), according to:
  - Paper and paperboard, food and garden waste, plastics, glass, textiles, other (specify according to inert or organic waste, respectively)
- Fraction of wastes recycled
- Fraction of wastes incinerated
- Number of solid waste disposal site (SWDS) recovering CH_4

Wastewater handling:

- With regard to data on N_2O from wastewater handling to be reported in CRF table 6.B, Parties using other methods for estimation of N_2O emissions from human sewage or wastewater treatment should provide in the NIR corresponding information on methods, activity data and emission factors used.

Annex II[1]

CRF TABLES

Included in document FCCC/SBSTA/2002/2/Add.3

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[1] As described in paragraph 9 in the introduction to this note, the proposed revised reporting guidelines have two annexes: Annex I, entitled "National inventory report – proposed structure" and annex II "CRF tables". The guidelines text and the annexes will be published as a common document when the guidelines are agreed upon by the SBSTA.